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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/799,216	03/11/2004	Joon Chok Lee	70040124-1	7414

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EXAMINER	
AMADIZ, RODNEY	
ART UNIT	**PAPER NUMBER**
2629	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/30/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/799,216	LEE ET AL.	
	Examiner	Art Unit	
	Rodney Amadiz	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/11/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2 and 4-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muthu (U.S. Patent 6,507,159—herein referred to as "Muthu") in view of Iwauchi et al. (USPGPUB 2005/0117190—herein referred to as "Iwauchi").

As to **Claim 1**, Muthu teaches a control system for a Light Emitting Diode (LED) based light system ***(Fig. 1)***, comprising: a plurality of feedback units for generating feedback signals representative of luminance and chrominance characteristics ***(Reference Numbers 20 and 21 and Col. 1, line 55—Col. 2, line 4 and Col. 4, lines 38-66)***; and a controller in signal communication with said plurality of feedback units configured to provide drive signals to light source assemblies ***(30 and 33)*** and to adjust said drive signals in response to feedback signals from said plurality of feedback units ***(Col. 1, line 55—Col. 2, line 4 and Col. 3, line 57—Col. 4, line 15)***. Muthu; however, fails to teach providing the drive signals to light source assemblies during respective non-overlapping intervals. Examiner cites Iwauchi to teach a control system for a Light Emitting Diode (LED) based light system ***(Fig. 1)***, wherein the controller provides the drive signals to the light source assemblies in respective non-overlapping intervals ***(Fig. 3 and Pg. 2, ¶'s 16, 18 and 26 and Pg. 4, ¶'s 56-61)***. At the time the invention was

made, it would have been obvious to a person of ordinary skill in the art to incorporate the use of driving light sources during respective non-overlapping intervals as taught by Iwauchi in the LED control system taught by Muthu in order to better control the white point and/or luminance properties of the display ***(Iwauchi—Pg. 2, ¶ 14)***.

As to **Claim 2**, Muthu, as modified by Iwauchi, teaches a feedback unit of said feedback units further comprising: a sensor for sensing luminance and chrominance characteristics during one of said non-overlapping intervals, wherein said non-overlapping interval is associated with said sensor and with one of said light source assemblies ***(Muthu—Fig. 1—note photosensors 21 (Rp, Gp and Bp) and Col. 1, line 55—Col. 2, line 4 and Col. 4, lines 38-66); as to the non-overlapping intervals note Iwauchi, Fig. 3 and Pg. 2, ¶'s 16, 18 and 26 and Pg. 4, ¶'s 56-61)***.

As to **Claim 3**, Muthu teaches a sample-and-hold module for sampling feedback signals from a sensor during a non-overlapping interval of said non-overlapping intervals and holding feedback signals during other non-overlapping intervals, wherein said non-overlapping interval is associated with said sample-and-hold module ***(Col. 8, lines 29-33)***.

As to **Claim 4**, Muthu teaches a light source, which includes a red LED, a green LED, and a blue LED ***(11 and Col. 3, lines 4-7)***; and a driver configured to provide color-specific drive signals to said red LED, said green LED, and said blue LED ***(14 and Col. 3, lines 17-31)***.

As to **Claim 5**, Muthu teaches said controller acquiring differences between said feedback signals and a reference value and adjusts said drive signals on a per-color

basis to compensate for said differences ***(21—note Rp, Gp and Bp and Col. 1, line 55—Col. 2, line 4 and Col. 3, line 17—Col. 4, line 15 and Col. 5, lines 5-25)***.

As to **Claim 6**, Muthu teaches a reference value generator for converting a reference input to CIE 1931 tristimulus reference values ***(32)***; and a feedback signal translator for converting a feedback signal of said feedback signals to CIE 1931 tristimulus measured values ***(See Figs. 2 and 4 and Col. 4, lines 38-65)***, wherein said controller acquires differences between said feedback signals and a reference value by determining a difference between said CIE 1931 tristimulus reference values and said CIE 1931 tristimulus measured values for each of said feedback signals ***(See Figs. 2 and 4 and Col. 4, lines 38-65 and Col. 5, lines 5-67)***.

As to **Claim 7**, Muthu teaches a reference value generator for: converting a reference input to CIE 1931 tristimulus reference values ***(32)***; and translating said CIE 1931 tristimulus reference values to tristimulus reference values in RGB space, wherein said controller acquires differences between said feedback signals and a reference value by determining a difference between said tristimulus reference values in RGB space and said feedback signals ***(See Fig. 3 and Col. 5, lines 26-38)***.

As to **Claim 8**, Muthu teaches feedback units providing feedback related to luminance and chrominance characteristics related to light source assemblies with which said feedback units are associated ***(20 and 21—Rp, Gp and Bp and Col. 1, line 55—Col. 2, line 4 and Col. 4, lines 38-66)***. Muthu, however, fails to teach a light guide panel for directing light from said light source assemblies to said feedback units. Examiner cites Iwauchi to teach a control system for a Light Emitting Diode (LED)

based light system ***(Fig. 1)*** with a light guide panel for directing light from the light source assemblies to the feedback units ***(Fig. 1, Reference Number 3)***. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the use of a light guiding panel as taught by Iwauchi in the LED control system taught by Muthu in order to uniformly irradiate light on a plane ***(Iwauchi—Pg. 2, ¶ 31)***.

As to **Claim 9**, Muthu, as modified by Iwauchi, teaches said controller providing said drive signals for a signal duration no longer than said non-overlapping interval; and said controller adjusts said drive signals on a per-color basis by changing said signal duration from a first duration to a second duration, wherein said second duration is no longer than said non-overlapping interval ***(Iwauchi—Fig. 3 and Pg. 2, ¶'s 16, 18 and 26 and Pg. 4, ¶'s 56-61)***.

As to **Claim 10**, Muthu teaches a method for controlling a Light Emitting Diode (LED) light system (Fig. 1), comprising: providing drive signals to light sources ***(14)***; receiving light source-specific feedback signals in response to said providing drive signals to light sources **(20 and 21 *and Col. 1, line 55—Col. 2, line 4 and Col. 4, lines 38-66*)**; and adjusting said drive signals in response to the light source-specific feedback signals ***(Col. 1, line 55—Col. 2, line 4 and Col. 3, line 57—Col. 4, line 15)***. Although Muthu teaches providing the signal to the light source and receiving feedback in response to the drive signals, he fails to teach doing both of these limitations during respective non-overlapping intervals. Examiner cites Iwauchi to teach a control system for a Light Emitting Diode (LED) based light system ***(Fig. 1)*** that provides drive signals

to the light source and receives feedback in response to the drive signals during respective non-overlapping intervals ***(Fig. 3 and Pg. 2, ¶'s 16, 18 and 26 and Pg. 4, ¶'s 56-61)***. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the use of driving light sources and receiving feedback signals during respective non-overlapping intervals as taught by Iwauchi in the LED control system taught by Muthu in order to quickly and effectively provide the white point and/or luminance adjustments needed to enhance the display ***(Iwauchi—Pg. 2, ¶ 14)***.

As to **Claim 11**, Muthu, as modified by Iwauchi, teaches providing said drive signals in repeating sequential non-overlapping intervals ***(Iwauchi—Fig. 3 and Pg. 2, ¶'s 16, 18 and 26 and Pg. 4, ¶'s 56-61)***.

As to **Claim 12**, Muthu teaches acquiring differences between said light source-specific feedback signals and a reference value; and adjusting said drive signals on a per-color basis to compensate for said differences ***(21—note Rp, Gp and Bp and Col. 1, line 55—Col. 2, line 4 and Col. 3, line 17—Col. 4, line 15 and Col. 5, lines 5-25)***.

As to **Claim 13**, Muthu teaches receiving a reference input ***(31—Col. 3, line 47—Col. 4, line 20)***; converting said reference input to said reference value ***(32—Col. 3, lines 47-60)***; comparing said reference value to said light source-specific feedback signals ***(Controller 33—Col. 1, line 55—Col. 2, line 4 and Col. 3, line 17—Col. 4, line 15 and Col. 5, lines 5-25)***.

As to **Claim 14**, Muthu teaches receiving a reference input ***(31—Col. 3, line 47—Col. 4; line 20)***; converting said reference input to said reference value ***(32—Col. 3,***

lines 47-60), wherein said reference value includes CIE 1931 tristimulus values ***(See Figs. 2 and 4 and Col. 4, lines 38-65)***; converting said light source-specific feedback signals to CIE 1931 tristimulus values ***(See Fig. 4 and Col. 5, lines 26-59)***; and comparing said reference value to said light source-specific feedback signals ***(See Figs. 2 and 4 and Col. 4, lines 38-65 and Col. 5, lines 5-67)***.

As to **Claim 15**, Muthu teaches generating said light source-specific feedback signals according to luminance and chrominance characteristics of light from said light sources ***(Reference Numbers 20 and 21 and Col. 1, line 55—Col. 2, line 4 and Col. 4, lines 38-66)***.

As to **Claim 16**, Muthu teaches a Light Emitting Diode (LED) based light system ***(Fig. 1)***, comprising: a plurality of light source assemblies ***(14)***; a plurality of feedback units ***(20 and 21)***, each of the feedback units being in optical communication with at least one of the light source assemblies ***(Rp, Gp and Bp)***; and a controller in signal communication with the light source assemblies and the feedback units ***(30 and 33)*** and configured to: provide drive signals to the light source assemblies ***(note signals from 33 to 14)***; receive light source-specific feedback signals from the feedback units in response to the drive signals ***(Col. 1, line 55—Col. 2, line 4 Col. 3, lines 32-36 and Col. 4, lines 38-66)***; and adjust the drive signals provided to the light source assemblies in response to the light source-specific feedback signals ***(Col. 1, line 55—Col. 2, line 4 and Col. 3, line 57—Col. 4, line 15)***. Although Muthu teaches providing the signal to the light source and receiving feedback in response to the drive signals, he fails to teach doing both of these limitations during respective non-overlapping intervals. Examiner

cites Iwauchi to teach a control system for a Light Emitting Diode (LED) based light system ***(Fig. 1)*** that provides drive signals to the light source and receives feedback in response to the drive signals during respective non-overlapping intervals ***(Fig. 3 and Pg. 2, ¶'s 16, 18 and 26 and Pg. 4, ¶'s 56-61)***. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the use of driving light sources and receiving feedback signals during respective non-overlapping intervals as taught by Iwauchi in the LED control system taught by Muthu in order to quickly and effectively provide the white point and/or luminance adjustments needed to enhance the display ***(Iwauchi—Pg. 2, ¶ 14)***.

As to **Claim 17**, Muthu teaches the feedback units include color sensors for detecting luminance and chrominance characteristics of light ***(Reference Numbers 20 and 21—photosensors Rp, Gp and Bp and Col. 1, line 55—Col. 2, line 4 and Col. 4, lines 38-66)***.

As to **Claim 18**, Muthu teaches the feedback units include color sensors for generating light source-specific feedback signals ***(Reference Numbers 20 and 21 and Col. 1, line 55—Col. 2, line 4 and Col. 4, lines 38-66)***.

As to **Claim 19**, Muthu teaches the controller configured to provide color-specific and light source-specific drive signals to the light sources in response to the light source-specific feedback signals ***(note signals output from controller 33 to drivers 14 and Col. 1, line 55—Col. 2, line 4 and Col. 3, line 57—Col. 4, line 15)***.

As to **Claim 20**, Muthu teaches the light source assemblies include red, green, and blue light emitting diodes (LEDs) ***(11 and Col. 3, lines 4-7)***; the feedback units

include color sensors for generating light source-specific feedback signals ***(Reference Numbers 20 and 21 and Col. 1, line 55—Col. 2, line 4 and Col. 4, lines 38-66)***; and the controller is configured to provide color-specific and light source-specific drive signals to the light source assemblies in response to the light source-specific feedback signals ***(note signals output from controller 33 to drivers 14 and Col. 1, line 55—Col. 2, line 4 and Col. 3, line 57—Col. 4, line 15)***.

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yuyama	U.S. Patent 6,069,676
Stuppi et al.	U.S. Patent 7,002,546

Inquiries

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney Amadiz whose telephone number is (571) 272-7762. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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